



### **THE VISION OF THE UNIVERSITY OF JORDAN**

A university excelling in pedagogy, research, and innovation and advancing in global standing

### **THE MISSION OF THE UNIVERSITY OF JORDAN**

Providing students with fulfilling learning experiences, conducting knowledge-producing research, and building firm societal ties, within an environment conducive to creativity, innovation, and entrepreneurship: making efficient use of resources and forging fruitful partnerships.

### **THE VISION OF THE SCHOOL OF REHABILITATION SCIENCES**

Leadership in the creation and development of knowledge, and in the preparation of human resources aspiring for excellence regionally and internationally

### **THE MISSION OF THE SCHOOL OF REHABILITATION SCIENCES**

To excel in the preparation and training of model rehabilitation personnel, who participate in the health and community sector, and provide the local and regional community with appropriate rehabilitation services based on needs. Through educational curricula that facilitates the implementation of up to date rehabilitation services based on the best available evidence.

## Course Syllabus

|    |  |  |  |
|----|--|--|--|
| 1  | Course title   | <i>Above knee orthoses</i>   |  |
| 2  | Course number  | <i>1833322</i>   |  |
| 3  | Credit hours   | <i>3 Theoretical</i>   |  |
|    | Contact hours (theory, practical)                    | <i>60 theoretical</i>  |  |
| 4  | Prerequisites/corequisites                           | <i>Successful completion of 1833221</i>  |  |
| 5  | Program title  | <i>BSc in prosthetics and orthotics</i>  |  |
| 6  | Program code   | <i>3</i>   |  |
| 7  | Awarding institution                                 | <i>The University of Jordan</i>  |  |
| 8  | School   | <i>School of Rehabilitation sciences</i>   |  |
| 9  | Department   | <i>Department of prosthetics and orthotics</i>   |  |
| 10 | Course level   | <i>Undergraduate</i>   |  |
| 11 | Year of study and semester (s)                       | <i>Second year/First semester</i>  |  |
| 12 | Other department (s) involved in teaching the course | <i>NA</i>  |  |
| 13 | Main teaching language                               | <i>English</i>   |  |
| 14 | Delivery method                                      | <input checked="" type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online   |  |
| 15 | Online platforms(s)                                  | <input checked="" type="checkbox"/> Moodle <input type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom<br><input type="checkbox"/> Others.....N/A..... |  |
| 16 | Issuing/Revision Date                                | <i>2024</i>  |  |

### 17 Course Coordinator:

Name: **Dr. Amneh Alshawabka**

Contact hours: **Mon (2-4)**

Office number: **428**

Phone number: **06/5355000-23226**

Email: [a.alshawabka@ju.edu.jo](mailto:a.alshawabka@ju.edu.jo)



### 18 Other instructors:

Name: N/A

Office number:

Phone number:

Email:

Contact hours

Name:

Office number:

Phone number:

Email:

Contact hours

### 19 Course Description:

This course covers the different disorders that can be treated (totally or partially) by above knee orthoses (KAFO, knee orthosis, hip orthosis, etc). Students will learn how to assess patients with such disorders and how to choose between the different available orthotic interventions. In addition, students will learn the biomechanical principles and ways of integrating such principles when treating a patient. Special emphases on knee orthoses will be given in this course. Throughout the course, students' skills in critical thinking, evidence-based practice and decision-making will be strengthened..

### 20 Course aims and outcomes:

#### A- Aims:

The main aim of this course is to provide the students with the knowledge, and confidence to biomechanically assess patients with lower limb deformities. Additionally, students will have the ability for evaluate orthotic prescriptions, decide, and fabricate the most appropriate type of above knee orthoses.

- 1- To provide the students with the knowledge about orthotics at the above knee level*
- 2- To understand the biomechanics associated with the different types of HKAFO, KAFO, KO and HO*
- 3- To understand the patho-biomechanics of lower limb deformities*
- 4- To formulate the best suited orthotic prescription for the patients*
- 5- To memorise the different HKAFO, KAFO, KO and HO components*

#### B- Students Learning Outcomes (SLOs):

Upon successful completion of this course, students will be able to:

| SLOs  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|----|----|----|
| <b>SLOs of the course</b>   |   |   |   |   |   |   |   |   |   |    |    |    |
| <b>1. Develop the knowledge of AK orthoses</b>  | X |   |   |   |   |   |   |   |   |    |    |    |
| <b>2. Recognize normal and pathological gait patterns that could be supported by above knee orthoses</b>                  | X |   |   |   |   |   |   |   |   |    |    |    |
| <b>3. Discuss biomechanical force systems and use these principles in generating an appropriate orthotic prescription</b> | X |   |   |   |   |   |   |   |   |    |    |    |
| <b>4. Appreciate how such forces may be best applied at the device/tissue interface to achieve clinical objective</b>     |   |   |   |   | X |   |   |   |   |    |    |    |

|   |   |  |   |   |  |  |  |  |   |   |  |   |
|---|---|--|---|---|--|--|--|--|---|---|--|---|
| <b>5. Describe the mechanical properties of the materials and be able to apply these concepts to the design and fabrication of the orthoses</b> |   |  |   | X |  |  |  |  |   |   |  |   |
| <b>6. Describe and explain the biomechanical principals underlying the designs of below knee orthoses</b>                                       | X |  |   |   |  |  |  |  |   |   |  |   |
| <b>7. understanding how the choice of component/ materials can affect the comfort of the orthoses and the stability and safety of their use</b> |   |  |   | X |  |  |  |  |   |   |  |   |
| <b>8. Compare and contrast the functional characteristics of orthotic components.</b>   |   |  |   |   |  |  |  |  |   | X |  |   |
| <b>9. Develop the essential clinical skills that enables the students to manufacture Above knee orthoses</b>                                    |   |  | X |   |  |  |  |  |   |   |  |   |
| <b>10. Formulate appropriate orthotic prescriptions for wide range clinical situations.</b>   |   |  |   | X |  |  |  |  |   |   |  | X |
| <b>11. Recognize the orthotics gait and its deviations.</b>   |   |  |   |   |  |  |  |  | X |   |  |   |



|   |  |  |  |  |   |  |  |  |  |  |  |  |
|---|--|--|--|--|---|--|--|--|--|--|--|--|
| <b>12. Be able to communicate professionally with patients and his/her team member</b>  |  |  |  |  | X |  |  |  |  |  |  |  |
| <p><b><u>Program SLOs:</u></b></p> <ol style="list-style-type: none"> <li>1. Application of the knowledge in physical sciences, social sciences, health sciences, culture and natural sciences to prosthetics and orthotics professional-practice. [application of knowledge]</li> <li>2. Demonstrate proficiency in communication skills with patients and other healthcare staff. [communication skills]</li> <li>3. Apply the skills of managing health practice (i.e. prosthetics and orthotics) in different environments and for different patients. [managing professional practices]</li> <li>4. Effective use of work-skills in a collaborative /professional environment. [group work]</li> <li>5. Preference and demonstration of social/professional responsibility as well as ethical behaviors in different environments and scenarios. [ethical behaviors]</li> <li>6. The ability to conduct appropriate examinations and evaluations of patients of all ages. [patient evaluation]</li> <li>7. Creating constructive ways to use the appropriate equipment, materials, components and technologies in the building of prosthetics and orthotics devices. [efficiency in the use of materials].</li> <li>8. Planning, developing and implementing treatment-plans appropriate for each patient according to the age and needs of the patient within a broad and continuous series of necessary health-care treatment-plans. [planning]</li> <li>9. Demonstrate, in a systematic and effective manner, the ability to transfer knowledge when providing education to users, care-givers, other health professionals and the public. (knowledge transfer)</li> <li>10. Demonstrate appropriate competencies in research and evidence-based practice. [evidence-based practice]</li> <li>11. Demonstrate basic research skills [conduct a research]</li> <li>12. Actively engage in lifelong learning activities. [continuous learning]</li> </ol> |  |  |  |  |   |  |  |  |  |  |  |  |

## 21. Topic Outline and Schedule:

| Week | Lecture | Topic  | Student Learning Outcome | Learning Methods (Face to Face/Blended/ Fully Online) | Platform | Synchronous / Asynchronous Lecturing | Evaluation Methods | Resources |
|------|---------|--|--------------------------|---|----------|--------------------------------------|--------------------|-----------|
| 1    | 1.1     | <i>Introduction &amp; course syllabus</i>                        | -                        | <i>Face to face</i>                                   | NA       | <i>Synchronous</i>                   | <i>Exams</i>       | -         |
|      | 1.2     | <i>Quantifying Functional Loss</i>                               | 1,2,5                    | <i>Face to face</i>                                   | NA       | <i>Synchronous</i>                   | <i>Exams</i>       | 1,2,4,8   |
|      | 1.3     | <i>Prescription Exercise: linking assessment to prescription</i> | 1,4,6,7                  | <i>Face to face</i>                                   | NA       | <i>Synchronous</i>                   | <i>Exams</i>       | 1-3       |
| 2    | 2.1     | <i>Conventional KAFO</i>   | 1,2,3                    | <i>Face to face</i>                                   | NA       | <i>Synchronous</i>                   | <i>Exams</i>       | 1,4,5     |
|      | 2.2     | <i>Plastic metal KAFO1</i>                                       | 1-5                      | <i>Face to face</i>                                   | NA       | <i>Synchronous</i>                   | <i>Exams</i>       | 1, 5-8    |
|      | 2.3     | <i>Kinesiology of the knee joint</i>                             | 1-5                      | <i>Face to face</i>                                   | NA       | <i>Synchronous</i>                   | <i>Exams</i>       | 1,5-8     |
| 3    | 3.1     | <i>Hybrid KAFO</i>   | 1,5,6,7,8                | <i>Face to face</i>                                   | NA       | <i>Synchronous</i>                   | <i>Exams</i>       | 1         |
|      | 3.2     | <i>Components of Hybrid KAFO</i>                                 | 1-8                      | <i>Face to face</i>                                   | NA       | <i>Synchronous</i>                   | <i>Exams</i>       | 1,2,3     |
|      | 3.3     | <i>Hybrid KAFO vs. plastic KAFO</i>                              | 1-8                      | <i>Face to face</i>                                   | NA       | <i>Synchronous</i>                   | <i>Exams</i>       | 1,2,3     |
| 4    | 4.1     | <i>Technical notes: Casting KAFO</i>                             | 2,5,7,8,9                | <i>Face to face</i>                                   | NA       | <i>Synchronous</i>                   | <i>Exams</i>       | 1         |
|      | 4.2     | <i>Orthotic Knee joint types1</i>                                | 1-10                     | <i>Face to face</i>                                   | NA       | <i>Synchronous</i>                   | <i>Exams</i>       | 5-7       |

|    |         |  |             |                     |    |                     |                      |          |
|----|---------|--|-------------|---------------------|----|---------------------|----------------------|----------|
|    | 4.3     | <i>Orthotic Knee joint types2</i>  | 5,8         | <i>Face to face</i> | NA | <i>Synchron ous</i> | <i>Exams</i>         | 1,2      |
| 5  | 5.1,2,3 | <i>Orthotic Knee joint types3</i>  | 7,8,10      | <i>Face to face</i> | NA | <i>Synchron ous</i> | <i>Exams</i>         | 6,7      |
| 6  | 6.1,2,3 | <i>KAFO design: Biomechanics, Orthotic Design and Prescription Choices</i> | 1-12        | <i>Face to face</i> | NA | <i>Synchron ous</i> | <i>Exams</i>         | 1-7      |
| 7  | 7.1     | <i>Technical notes: knee joint congruency</i>                              | 1,4,6,7     | <i>Face to face</i> | NA | <i>Synchron ous</i> | <i>Exams</i>         | 1        |
|    | 7.2     | <i>Knee orthoses1</i>  | 1-9         | <i>Face to face</i> | NA | <i>Synchron ous</i> | <i>Exams</i>         | 1,4,5, 6 |
|    | 7.3     | <i>Midterm exam</i>  | 1-9         | <i>Face to face</i> | NA | <i>Synchron ous</i> | <i>Exams</i>         | 1,5      |
| 8  | 8.1     | <i>Knee orthoses2</i>  | 7,8,9,10,11 | <i>Face to face</i> | NA | <i>Synchron ous</i> | <i>Exams</i>         | 4-7      |
|    | 8.2,3   | <i>HKAFO</i>   | 7-12        | <i>Face to face</i> | NA | <i>Synchron ous</i> | <i>Exams</i>         | 4-7      |
| 9  | 9.1     | <i>RGO</i>   | 1-9         | <i>Face to face</i> | NA | <i>Synchron ous</i> | <i>Exams</i>         | 1,2,3, 4 |
|    | 9.2     | <i>Orthotic management of common pathology: poliomyelitis</i>              | 1-12        | <i>Face to face</i> | NA | <i>Synchron ous</i> | <i>Exams</i>         | 1        |
| 10 | 10.1    | <i>SCI</i>   | 1-12        | <i>Face to face</i> | NA | <i>Synchron ous</i> | <i>Assignme nt -</i> | -        |
|    | 10.2,3  | <i>Orthotic management</i>   | 1-12        | <i>Face to face</i> | NA | <i>Synchron ous</i> | <i>Assignme nt -</i> | -        |



|           |                 |   |                  |                     |           |                    |                        |            |
|-----------|-----------------|---|------------------|---------------------|-----------|--------------------|------------------------|------------|
|           |                 | <i>of common pathology: SCI</i>                             |                  |                     |           |                    |                        |            |
| <b>11</b> | <b>11.1</b>     | <i>Orthotic management of common pathology: DDH</i>         | <i>1,2,4,7,8</i> | <i>Face to face</i> | <i>NA</i> | <i>Synchronous</i> | <i>Exams</i>           | <i>1,2</i> |
|           | <b>11.2</b>     | <i>Orthotic management of common: Legg-Perthes' disease</i> | <i>,2,4,7,8</i>  | <i>Face to face</i> | <i>NA</i> | <i>Synchronous</i> | <i>Exams</i>           | <i>1.2</i> |
| <b>12</b> | <b>12.1</b>     | <i>Case studies</i>   | <i>1,2,4,7,8</i> | <i>Face to face</i> | <i>NA</i> | <i>Synchronous</i> | <i>Exams</i>           | <i>1.2</i> |
|           | <b>12.2,3</b>   | <i>Student assignment</i>                                   | <i>All</i>       | <i>Face to face</i> | <i>NA</i> | <i>Synchronous</i> | <i>Attached rubric</i> | <i>All</i> |
| <b>13</b> | <b>13.1,2,3</b> | <i>Student assignment</i>                                   | <i>All</i>       | <i>Face to face</i> | <i>NA</i> | <i>Synchronous</i> | <i>Attached rubric</i> | <i>All</i> |
| <b>14</b> | <b>14.1,2,3</b> | <i>Student assignment</i>                                   | <i>All</i>       | <i>Face to face</i> | <i>NA</i> | <i>Synchronous</i> | <i>Attached rubric</i> | <i>All</i> |
| <b>15</b> |                 | <i>Final exam</i>   | <i>All</i>       | <i>Face to face</i> | <i>NA</i> | <i>Synchronous</i> | <i>Exams</i>           | <i>All</i> |

### References:

1. AAOS Atlas of Orthoses and Assistive Devices. Bertram Goldberg, John D. Hsu. 4<sup>th</sup> edition.
2. Lower Limb Orthotics; Orthotist supplement. New York University.
3. Lower Limb Orthotics; New York University.
4. Clinical anatomy for medical students, (7th Ed.), Snell Richard S.
5. Biomechanics: Principles and Application, Furey, Michael J. "Joint lubrication." (2000).
6. Biomechanics in Clinic and Research. Jim Richards.
7. Orthotics: A comprehensive Clinical Approach. Joan E. Edelstein, 1<sup>st</sup> edition, SLACK 2002.
8. Gait analysis: normal and pathological function. New Jersey: SLACK. Jacquelin Perry, M., 2010.



## 22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

| Evaluation Activity  | Mark      | Topic(s)               | SLOs        | Period (Week)  | Platform            |
|----------------------|-----------|------------------------|-------------|----------------|---------------------|
| <i>Assignment</i>    | <i>20</i> | <i>Selected topics</i> | <i>1-12</i> | <i>Week 12</i> | <i>Face to face</i> |
| <i>Mid-term exam</i> | <i>30</i> | <i>1-6</i>             | <i>1-8</i>  | <i>Week 7</i>  | <i>Face to face</i> |
| <i>Final exam</i>    | <i>50</i> | <i>1-14</i>            | <i>1-12</i> | <i>Week 15</i> | <i>Face to face</i> |

## 23 Course Requirements

Students should have internet connection, a computer and access to e-learning system. All theory lectures are face to face.

## 24 Course Policies:

### A. Attendance policies:

- 1- Attendance will be taken periodically throughout the semester.
- 2- Students are expected to attend and actively participate in all classes.
- 3- Students are expected to be on time.
- 4- When the student is unable to attend class, it is a courtesy to notify the instructor in advance using either e-mail.
- 5- Repeated tardiness or leaving early will not be accepted.
- 6- Students who miss class (or any portion of class) are responsible for the content. Any student who misses a class has the responsibility for obtaining copies of notes, handouts, assignments, etc. from class members who were present. If additional assistance is still necessary, an appointment should be scheduled with the instructor. Class time is not to be used to go over material with students who missed class(es).
- 7- An absence of more than 15% of all the number of classes, which is equivalent of 3 lectures, requires that the student provides an official excuse to the instructor and the dean.
- 8- If the excuse was accepted the student is required to withdraw from the module.
- 9- If the excuse was rejected the student will fail, and mark of zero will be assigned as suggested by the laws and regulations of the University of Jordan.

### B. Absences from exams and submitting assignments on time:

- 1- The instructor will not do any make-up exams.
- 2- Exceptions for make-up exams and late submission of class assignments will be made on a case-by-case basis for true personal emergencies that are described as accepted by the regulations of UJ (e.g., documented medical, personal, or family emergency).
- 3- Make-up exams will be arranged if justifications for missing the exam satisfy the above. It is the student's responsibility to contact the instructor within 24 hours of the original exam to schedule a make-up session. A make-up exam should be taken within a week from the original exam date, unless the student can provide documentation that makes meeting that deadline impossible; otherwise, the recorded score for that exam for the student will be a zero.
- 4- Late assignments will not be accepted and submission of assignments (due to unjustified absence from class) by other students will not be accepted regardless of how much work the student put into its preparation.

#### **C- Health and safety procedures:**

- 1- Students will not be in direct contact with patients during this course.
- 2- Students are not expected to use any heavy tools or equipment that might impose health and safety issues during this course.
- 3- Students should work safely, including being able to select appropriate hazard control and risk management, reduction or elimination techniques in a safe manner in accordance with health and safety legislation.
- 4- Students should understand the importance of and be able to maintain confidentiality.
- 5- Students should understand the importance of and be able to obtain informed consent.
- 6- Students should know the limits of their practice and when to seek advice or refer to another professional

#### **D- Honesty policy regarding cheating, plagiarism, misbehavior:**

- 1- Students are expected to observe all University guidelines pertaining to academic misconduct.
- 2- Any work submitted by a student for academic credit must be the student's own work. Submission of work taken directly from another source (e.g., book, journal, internet, clinic forms, or another student work) will be considered plagiarism and the student/group will get a zero grade for that work if part of an assignment. In addition, if copying occurred, both the student who copied the work and the student who gave material to be copied (if applicable) will receive a zero for the assignment.
- 3- Students are expected to do work required for assignments on their own. Asking other instructors at the JU clinic or the staff, or other students to assist in or do any part of the assignment for them will negatively affect their grade on that assignment. The course instructor is the person the student needs to talk to if s/he has any difficulties pertaining to an



assignment or project and is strongly encouraged to schedule an appointment with the instructor if such difficulties arise during the semester.

- 4- Course materials prepared by the instructor, together with the content of all lectures and review sessions presented by the instructor are the property of the instructor. Video and audio recording of lectures and review sessions without the consent of the instructor is prohibited.
- 5- Any forms of academic misconduct will be handled according to the University of Jordan guidelines.

#### **E- Grading policy:**

1. Grading for this course will be determined based upon the accumulation of points for variety of assignments and exams.
2. All work will be evaluated on completeness, organization, clarity of information, and the integration and application of the material.

#### **F- Available university services that support achievement in the course:**

1. The University of Jordan provides many services to support social, health, and mental well-being of students in general and students with disabilities in specific. Students are advised to visit the Faculty of Students Affairs to learn more about those services.
2. If you are a student with a disability for which you may request accommodations, please notify the staff of Services for Student with Disabilities (Faculty of Students Affairs) as soon as possible. Please also contact the instructor as soon as possible (email is acceptable) so the appropriate accommodations for this course can be made.

### **25 References:**

#### **A- Required book(s), assigned reading and audio-visuals:**

1. AAOS Atlas of Orthoses and Assistive Devices. Bertram Goldberg, John D. Hsu. 4th edition.
2. Lower Limb Orthotics; Orthotist supplement. New York University.
3. Lower Limb Orthotics; New York University.
4. Clinical anatomy for medical students, (7th Ed.), Snell Richard S.
5. Biomechanics: Principles and Application, Furey, Michael J. "Joint lubrication." (2000).
6. Biomechanics in Clinic and Research. Jim Richards.
7. Orthotics: A comprehensive Clinical Approach. Joan E. Edelstein, 1st edition, SLACK 2002.

#### **B- Recommended books, materials, and media:**

- Students should have internet connection, a computer and access to Microsoft Teams and the e-learning system. All theory lectures will be given face to face and will be provided at the dashboard of the e-learning system.



- Articles and teaching materials provided by lecturer through the e-learning website
- Videos of practical content uploaded on Microsoft Stream, E-learning and YouTube

## 26 Additional information:

- This course builds on the knowledge that you have obtained in the Physics, anatomy, Orthopedics, Gait analysis and biomechanics so make sure that you prepare and revise the necessary information.
- This course is highly dependent on the e-learning website so make sure you have access to this platform and you can download the materials and access the lectures.
- If you require any further information, make sure to e-mail the instructor and arrange for a meeting during the announced office hours.

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|--|
| Name of Course Coordinator: <b>-Dr. Amneh Al-shawbka</b> -----Signature: <b>Amneh Al-shawbka</b>         |
| Head of Curriculum Committee/Department: <b>Dr.Amneh Al-shawbka</b> - Signature: <b>Amneh Al-shawbka</b> |
| Head of Department: --- <b>Dr. Amneh Al-shawbka</b> ----- Signature: -- <b>Amneh Al-shawbka</b>          |
| Head of Curriculum Committee/Faculty: -Prof. Kamal Hadidi- Signature: ----KAH----                        |
| Dean: Prof. Kamal Hadidi- Signature: ----KAH----   |